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EFFICIENCY OF VEGETABLE PRODUCTION UNDER IRRIGATION SYSTEM IN ILORIN METROPOLIS: A CASE STUDY OF FLUTED PUMPKIN (*Telferia occidentalis*).

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ABSTRACT
The study was carried out in Ilorin metropolis of Kwara State, Nigeria. It investigated the costs and return analysis of the respondents and the stochastic frontiers production analysis was applied to estimate the technical, allocative and economic efficiency among fluted pumpkin farming households in the metropolis. The result of the gross margin analysis showed that the average gross margin per farmer was ₦21,252. The results of economic efficiency also revealed an average of 0.904 while the mean technical and allocative efficiency were 0.978 and 0.925 respectively. Stochastic frontier production model showed that fertilizer and labour were found to be significant factors that contributed for the technical efficiency of the farmers while plot size and labour also were significant factors for allocative efficiency. The results therefore concluded that only years of experience and size of plot were the significant factors in the inefficiency sources model. On the basis of the findings, the study recommends that the government should provide conducive environment for the establishment of modern irrigation facilities for dry season farming, encourage more citizenry, especially the youths to practice dry season vegetable farming in a bid to alleviate poverty status and unemployment in the state and the country at large.

KEYWORDS: Fluted pumpkin, farming, technical, allocative and economic efficiency.

INTRODUCTION

Telfairia occidentalis otherwise called fluted pumpkin is one of the commonest, popular cut herbs grown mainly in southeastern Nigeria and belongs to the cucurbitaceace family. The crop, which originated from West Africa, is a perennial climber grown for its leaves and seeds, which are very nutritious (Schippers, 2000). Fluted pumpkins can be cultivated on the flat land or on mounds. In home gardens, they are frequently grown along a fence or next to a tree, thus allowing the fruit to hang from a branch. They are also raised along stakes of various types including bamboo [Akoroda, 1990]. *Telfairia* does best at the lower altitudes and medium to high rainfall and will do well on sandier soil provided fertilizer is applied but has a more robust growth in rich well drained soil. When planting for leaves, the usual spacing is 50 x 50cm for a mono-crop or occasionally even closer. Some farmers plant in the middle of a 1.20m- wide bed at 40cm interval, and others plant on a mound next to a stake.

There is a clear need for location- specific plant density trials. When seed supply is not a limiting factor, farmers like to plant two (or three) seeds/hole just in case seeds fail to germinate [Odiaka, 1997]. Nitrogen is essential for adequate vegetation and should ideally be given in the form of manure, applied before planting. The use of well-decomposed manure is essential for fruit production and in this case it is recommended that about 1 kg manure/ plant be applied. For maximum leaf yields, it is advisable to top dress with a nitrogen fertilizer immediately after each harvest. The maturity period for vegetative growth is between one to six months while for fruits, it is 6-8 months. Harvesting of shoots up to 50cm long can begin 1 month after germination followed by 3-4 week intervals when new shoots are formed. Fresh shoot yields is usually about 500-1000kg/harvesting/ha, but could be more if the crop receives adequate manure or when fertilizers are applied after each picking [Akinsami, 1975; Schippers, 2000].

The major crops grown under irrigation are vegetables, wheat and rice with initial bias for vegetables [Olugbemi, 1989]. Vegetables, which are rich sources of vitamins, minerals, carbohydrates, protein and dietary fibres are important to the human diet. A balanced diet should contain 250-325g of vegetables and the average human requirement for vegetable is 285g/person/day for a balanced diet [Nwachukwu, and Onyenweaku, 2007]. Over dependence on rain-fed agriculture has led to seasonal vegetable shortage, fluctuation in vegetable prices, nutritional inadequacy, which dry season vegetable production would have solved [Ayoade, 1988]. Outside Nigeria, where

fluted pumpkin is frequently eaten by up to 35 million people, and apart from West Cameroon, it is far less well known and, if so, then mainly for its immature edible seeds rather than for its shoots and leaves.

Indigenous vegetable production in Nigeria is rapidly decreasing due to water scarcity problem associated with the cropping season. In the past, indigenous vegetables were largely grown under rain fed condition. However, pure rain fed cultivation especially in the dry zones of Nigeria can seldom be practiced at present due to erratic nature of rainfall. The present rainfall pattern in Nigeria creates prolonged dry season period during cropping season which affects crop development and compel the need for crop irrigation. Irrigation method practiced currently for vegetables is manual that consumes high labour cost as well as large amount of water (Narvaratne, 2009). Hence farmers hesitate to grow vegetable under irrigation conditions, even though the economic value of these vegetables is high compared to other crops. If it becomes a long term practice, it would cause disappearance of indigenous vegetables indirectly which has high nutritional and medicinal value. As such, development of an appropriate irrigation method which has high water use efficiency and low labour requirement has become an urgent need to develop indigenous vegetables.

Vegetables have tremendous potentials to address poverty alleviation and nutritional security because they are affordable and easily available, easy to grow, require minimum production inputs, rich in vitamins and minerals, and are loaded with phytochemicals and anti-oxidants properties (Eusebio, 2009). Food security remains a challenge for Africa and other developing countries. More than half of the population studied in Africa between 1995 and 2000 experienced food insecurity. Stunting as well as high levels of vitamins A and iron deficiencies, due to inadequate dietary intake, is one of the major causes (Averbeke,2009). The use of Western vegetable has declined in Africa in the last 20 years. The consumption of indigenous food plant has gone up. Many of the indigenous plants are harvested from the wild. With increased demand, it becomes imperative to cultivate selected crops most suitable for addressing nutrient deficiencies. Some of these crops have tremendous potentials to address food insecurity. Of these, fluted pumpkin seems most appropriate for the African region mostly affected by food insecurity. Recent work by Okokoh (2005), reveals that fluted pumpkin either as juice or pulse has high level medicinal value in treatment of sexual impotence, maintenance of prostate gland, urinary and digestive disorders and acts as immuno-stimulant and vermifuge. And according to Lithan (2005) sexual ability and general healthcare are directly related to nutrition.

Efficiently combining inputs to yield output is the primary task of farm management. When two firms in an industry use the same inputs and employ the same technology, yet produce different quantities of output, the implication is that at least one firm is producing inefficiently. The technical efficiency indicates the producer’s ability to achieve maximum output from a given quantities of input and existing technology. Most recent studies have failed to critically examine the importance of producing fluted pumpkin during dry season under irrigation system against the popular rain fed system with a view of ascertaining their economic efficiency. If fluted pumpkin is to play a vital role in ensuring future food availability for food security and nutrition in the country, this sector has to develop and expand in an economically viable and environmentally sustainable manner.

The efficient allocation of resources at the farm level has implication for investment and employment at the national level. It is also the indicator by which success of production units are evaluated. When measured correctly, it makes it easier to separate its effects from the effects of production units thereby enabling the enactment of sound policies by which farm level performance could be improved (Ayanwale and Abiola, 2008). Among many other factors, increasing efficiency of resource use and productivity at the farm level is one of the pre-requisites for sustainable agriculture (FAO, 1997). Measuring technical efficiency at the farm level, identifying important factors associated with the efficient production system would serve as a panacea to assessing potential for developing sustainable vegetable production.

Economic efficiency is therefore derived from a cross product of the technical efficiency and allocative efficiency (i.e. technical efficiency x allocative efficiency). The technical efficiency of an individual firm is defined as the ratio of the observed output to the corresponding frontier output, given the available technology while allocative efficiency reflects the ability of the producers to use inputs in optimal proportions given their respective prices (Ajibefun and Daramola, 1999). There are four major approaches to measure and estimated efficiency (Dey *et al*,

2000). These are the non-parametric programming approach , the parametric programming approach (Aigner and Chu, 1968; Ali and Chaudhry, 1990], the deterministic statistical approach [Schmidt, 1976;] and the stochastic frontier production function approach [Aigner *et al*, 1976; Aigner *et al*, 1977; Meeusen and Van Den Broeck, 1977]. Among these, the stochastic frontier production function and non-parametric programming, known as data envelopment analysis (DEA), are the most popular approaches. The stochastic frontier approach is preferred for assessing efficiency in agriculture because of the inherent stochasticity involved. [Fare *et al*, 1985; Kirkley *et al*, 1995; Coelli *et al*, 1998]. Economic efficiency however depends on market forces, which in turn are influenced by the sectoral and marketing policies of the country. Empirical literature has shown that efficiency could be measured from a production function or a profit function approaches. The profit function approach is much more helpful when individual or sole enterprises are considered [Nwachukwu and Onyenweaku (2007)].

Apart from several studies by Nwachukwu and Onyenweaku (2007); Ayanwale and Abiola (2008) and Odiaka *et al* (2008) conducted in fluted pumpkin production in the country, a stochastic production frontier has not been widely applied to determine the production efficiency of the fluted pumpkin producers under irrigation system.

The objectives of this research are to: (1) find the socio-economic characteristics of the fluted pumpkin farmers, (2) to estimate the technical, allocative and economic efficiency among the fluted pumpkin farmers using irrigation system and (3) identifying the specific factors affecting fluted pumpkin enterprise in the state. Research hypotheses will address the following:

H_{01} : Inefficiency sources model do not have effects in the use of resources.

$H_{02:}$ Inefficiency sources model have effects in the use of resources.

METHODOLOGY

Area of the Study: The study was carried out in Ilorin, the Kwara state capital. The state serves as a ‘bridge’ state between the Northern and South-Western Nigeria. It shares its boundaries with Ondo, Oyo, Osun, Niger and Kogi states in Nigeria and an international border with the Republic of Benin. The state has a population of about 2.37million people (NPC, 2006). The state has two distinct seasons annually: the dry and wet seasons. It has sizeable expanse of arable land, rich fertile soils which is good for the cultivation of a wide variety of food crops like yam, cassava, maize, cowpea, fruits and vegetables. Fluted pumpkin, amaranthus and cochorus are significant vegetable crops commonly grown in the area throughout the year. Dry season vegetable production is done along the coastal areas of Asa River and other smaller streams that run across the metropolis. Cultivation and consumption of fluted pumpkin (*Telferia occidentalis*) is alien to the state. *T. occidentalis* originated from the oriental states of Nigeria from where it was introduced to some different parts of Nigeria. Hence majority of the correspondents used in this study were from the Eastern part of Nigeria resident in the state involved in the production of fluted pumpkin. Cultural diffusion and free trade across the country paved way for the production and consumption of fluted pumpkin by majority of the citizenry. Local vegetables such as *Amaranthus spp.* and *celosia argente* etc are gradually giving way to fluted pumpkin as a major vegetable food among the people of the state. The vegetable has no local name hence it is still widely referred to as ‘ugu’ in the state, the original name it is called in the East.

Fluted pumpkin is mainly produced in Ilorin metropolis for pumpkin consuming population and sometimes marketers go as far as Ibadan and Lagos to buy in order to augment local production. There is no evidence of commercial fluted pumpkin production in the other parts of the state.

Sample Selection

The target population of this study is the households that produce fluted pumpkin under irrigation system. A two-stage sampling procedure was used to select a representative sample for the study. The first stage was the random selection of 10 areas along the coastline in the zone and the second stage involved the random selection of 10 household- respondents from each of the coastal areas engaged in dry season fluted pumpkin production, making a total of 100 respondents. The data for the study were extracted from the respondents through questionnaire method followed with personal interview by the researcher where necessary. Additional information for the study was sourced from secondary sources such as journals and periodicals, Food and Agricultural Organisation circulars, etc.

Theoretical Underpinning/Conceptual Framework
Following Farell's (1957) article on efficiency measurement which led to the development of several approaches to efficiency and productivity analysis, among these is the Data Envelopment Analysis (AEA). As noted by Coelli et al, (1998), the stochastic frontier is considered more appropriate than DEA in agricultural applications especially in developing countries where the data is likely to be influenced by measurement errors and effects of weather conditions, disease etc. This equally applies to the applications of frontier techniques to agriculture, including fluted pumpkin production. However, the modeling and estimation of frontier production function has been a subject of considerable interest in econometrics and applied economic analysis during the last two decades. Review of frontier production is given by Forsund, *et al* (1980), Bauer (1990) and Battese and Coelli (1992). The stochastic frontier production proposed by Battese and Coelli (1992) assumed that a random sample of farms is observed over t-period such that the production of n farms over time is a given function of input variables and random variables which involve the traditional random error and non-negative random variable which are associated with technical inefficiencies of production. One of the earliest empirical studies in stochastic frontier production function was an analysis of the source of technical inefficiency in the Indonesian Wheat Industry by Pit and Lee, (1983). The study estimated a stochastic frontier production function by the method of maximum likelihood and the prediction of technical inefficiencies were then regressed upon size of firm, age and ownership structure of each firm. These variables were found to have significant effect on the degree of technical inefficiency of the firms.

Battese and Coelli, (1992) also investigated factors which influenced the technical inefficiency of Indian Farmers using a stochastic frontier production function which incorporated a model for the technical inefficiency effects, results found out that some farmers were able to achieve maximum efficiency while others were technically inefficient. Onu et al, (2000) similarly investigated the determinants of cotton production and economic efficiency using a stochastic frontier production function, which incorporated a model of inefficiency effects. The results indicated that labour and material input were the major factors associated with changes in the output of cotton. Farmers –specific variables which comprise status of farmers, education, experience, and access to credit facilities were found to be significant factors that accounted for the observed variation in inefficiency among the cotton producers.

The frontier production model analysis for cross sectional data can be defined by considering a stochastic production function with a multiplicative disturbance term of the form:

$$Y = f(X_a \beta) e^{\varepsilon} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (1)$$

Where,
Y = the quantity of the original output
X_a = a vector of input quantities
β = a vector of parameters and
$^{\varepsilon}$ = error term Where 'ε' is a stochastic disturbance term consisting of two independent elements 'μ' and 'v'
where, $\varepsilon = \mu + v$ ………………………………...(2)

The symmetric component 'v' accounts for random variation in output due to factors outside the farmers control such as weather and disease. It is assumed to be independently and normally distributed with zero mean and constant variance as $N\sim(0,\sigma^2_v)$. A one sided component $\mu < 0$ reflects technical inefficiency relative to the stochastic frontier, $(f(x_a,\beta)\ e^{\varepsilon})$. Thus, $\mu = 0$ for a farm output which lies on the frontier and $\mu < 0$ for one whose output is below the frontier as $[N\sim(0,\sigma^2_u)]$, that is , the distribution of 'μ' is half normal.

The frontier of the farm is given by combining (1) and (2).

$$Y = f\ f(x_a,\beta)\ e^{(u+v)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(3)$$

Measures of efficiency for each farm can be calculated as:

$$TE = \exp.\ [E\{\ \mu/\varepsilon\}] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(4)$$

And 'μ' in equation (4) is defined as :

$$\mu = f(z_b, \sigma) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(5)$$

Where z_b = a vector farmer specific factor.
σ = a vector of parameters.

The parameters for the stochastic production frontier model in equation (3) and those for the technical inefficiency model in equation (5) were estimated simultaneously using the maximum-likelihood estimation (MLE) programme , FRONTIER 4.1 (Coelli, 1994), which gives the variance parameter of the likelihood function in terms of $\sigma^2 = \sigma^2_u + \sigma^2_v$,

$$\gamma = \sigma^2_u / \sigma^2$$

In terms of its value and significance, γ is an important parameter in determining the existence of a stochastic frontier: rejection of the null hypothesis. H_{o1} : $\gamma = 0$ implies the existence of a stochastic production frontier. Similarly, $\gamma = 1$ implies that all the deviation from the frontier are due mainly to technical inefficiency (Coelli, *et al*., 1998).

Data Analysis
The tools employed for the analysis of this study were descriptive and stochastic frontier production function. The descriptive statistical tool comprised frequency counts, percentages and means, which were used to analyse the socio-economic characteristics of the fluted pumpkin producers in the state. The stochastic frontier production function was used to estimate the efficiencies of the producers.

Analytical procedures
Descriptive statistics was used to describe the costs and return of the fluted pumpkin farming households in the study area.

The Empirical Stochastic Frontier Production Model
Following the standard assumption that farmers maximize expected profits (Zellner et al, 1966), a single equation Cobb-Douglas stochastic production frontier was applied to the analysis of fluted pumpkin farmers in the state specified as follows:

$Q_i = f(x_1, \beta_i) \exp(v_i - u_i)$ (implicit) ………………………………….(5)

$\ln Q_i = \beta_0 + \beta_1 \ln x_1 + \beta_2 \ln x_2 + ,\ldots, + \beta_n \ln x_n + v_i - u_i$ (explicit) ……………………(6)

For technical efficiency specification:
Where Qi = output of the i-th farm in kilogrmme (kg)
Plot(x1) = size of plot/farm (acre)
Fert.(x2) = quantity of fertilizer used (kg)
Seed(x3) = quantity of seed for planting material
Labour(x4) = total labour used (family and hired labour) in man days

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OtherMat(x5)= other materials used (quantity/month)
ln = natural logarithm.
β_0 = constant
β_1 = coefficient to be estimated

For allocative Efficiency Specification:
Qi = revenue from sales (output price x out of the i-th farm in (kg)
cplot(x1) = cost of plot (acre)
cFert.(x2) = cost of fertilizer used (kg)
cSeed(x3) = quantity of seed as planting material (kg)
clabour(x4) = monetary value of total labour used (family and hired labour)

cotherMat.(x5) = cost of other materials used (quantity/month)

RESULTS AND DISCUSION

Costs and Return Analysis of fluted pumpkin farming households.

Table1 explains the objective of determining the cost and return of fluted pumpkin farming households in Ilorin metropolis. The result showed that variable cost of production was the major cost involved in the production of fluted pumpkin by the households. They are mainly peasant farmers who rent all the equipment used for the production which would have constituted the fixed cost such as water pump, land and tilling implements. Labour constituted about 38.31% of the total variable cost which indicates the low level of mechanization of the farms. The average total revenue of the farmers was ₦ 97,709 for the period under review. The revenue was entirely from the sales of fluted pumpkin leaves. The farmers do not undertake pod production since according to them it is not as profitable the former.

Table 1: costs and return Analysis of an average fluted pumpkin farming household in Ilorin.

Item	value (₦/season)	value (₦/season)
A: Revenue (output x price)		
Leaf	97,709	
Pod	-	
B: Variable cost		
Seed	24,085	
Fertilizer	14,000	
Rent of farm plot	8,500	
Labour	30,009	
Others (levies, cost of sales)	1,710	
Total	78,304	
C: Total Average Gross Margin (A-B)		21,252

Source: Field survey, 2009.

Relative Efficiency Indices

The estimation of economic efficiency (Table 2) shows the relative efficiency indices by age category for fluted pumpkin farming households. The farmers operated at a high level of both average technical and allocative efficiency of 0.90% and above for all the age categories. Though, analysis revealed that farmers operated at a high economic efficiency level, but age group 40-49 operated at 0.87% which is far below average compared to the other groups. The results support the assertion of Kalirajan and Shand (1989), Shapiro and Muller (1977) that given a technology to transform physical inputs into output, some farmers are able to achieve maximum efficiency up to 100% while others are technically inefficient.

Table2: Relative Efficiency indices by age category for fluted pumpkin farmers in Ilorin: Estimation of Economic Efficiency.

Age category A	No. of farmers B	Sum of Tech.Eff. C	Sum of Allo. Eff. D	Av. Tech.Eff E (C/B)	Av. Allo. Eff. (%) F (D/B)	Av. Ecco .Eff. (%) E x F
<40 yrs	9	8.66	8.46	0.962	0.94	0.904
40-49	23	22.43	20.7	0.975	0.90	0.878
50-59	29	28.42	27.55	0.98	0.95	0.931
>60	39	38.61	35.49	0.99	0.91	0.901
Total	100					

Source: Field survey, 2009.

Stochastic Frontier Models

The results of the stochastic frontier model estimated further showed that there are significant differences in the technical, allocative and economic efficiency of the farmers in the study area. Quantity of fertilizer used and number

of labour (both family and hired) were found to be significant factors that were associated with technical efficiency, while cost of plot and labour were also found to be significant under allocative efficiency (Table3). The inefficiency sources model showed that years of experience and farm size contributed significantly to the explanation of efficiency tables of the farmers.

Table3:Result of Maximum likelihood estimate of the Cobb-Douglas frontier production functions for technical and allocative efficiency of the fluted pumpkin farmers.

Variable per parameter estimates	Coefficient	Std. error	t-value
A: Technical Efficiency			
Constant (β0)	0.369**	0.963	0.383
Ln plot (β1)	-0.522	0.228	-0.229
Ln Fert. (β2)	0.117***	0.684	0.171
Ln Seed (β3)	-0.142	0.261	-0.543
Ln Labour(β4)	0.310*	0.743	0.417
Ln Other materials (β5)	0.241	0.421	0.445
Sigma-squared ($\sigma s^2 = \delta u^2+\delta v^2$)	0.517	0.180	0.287
Gamma ($\gamma = \delta u^2 / \delta v^2$	0.535	0.117	0.459
Log (likelihood) (θ_0)	0.150		
Mean technical Efficiency	0.978		
B: Allocative Efficiency			
Constant (β0)	0.250**	0.559	0.447
Ln cplot (β1)	0.500***	0.200	0.250
Ln cFert. (β2)	0.12	-NAN	-NAN
Ln cSeed(β3)	-0.166	0.309	-0.537
Ln clabour(β4)	0.313*	0.367	0.851
Ln cotherMat.(β5)	0.213	0.432	0.256
Sigma-squared ($\sigma s^2 = \delta u^2+\delta v^2$)	0.103	0.140	0.312
Gamma ($\gamma = \delta u^2 / \delta v^2$	0.900	0.232	0.243
Log (likelihood) (θ_0)	0.896		
Mean Allocative Efficiency	0.925		
C: Estimate of the Inefficiency sources model for the farmers.			
Constant (δ0)	-0.678	0.153	-0.444
Age (δ1)	-0.176	0.796	-0.223
Household size (δ2)	-0.182	0.156	-0.117
Level of education(δ3)	-0.783	0.717	-0.109
Experience(yrs) δ5	0.965*	0.971	0.994
Farm size (δ5)	0.151**	0.924	0.163
Sigma-squared ($\sigma s^2 = \delta u^2+\delta v^2$)	0.517	0.180	0.287
Gamma ($\gamma = \delta u^2 / \delta v^2$	0.535	0.117	0.459
Log (likelihood) (θ_0)	0.150		
Mean technical Efficiency	0.978		

Source: Field survey, 2009.

* Significant at 1%, ** Significant at 5%, *** Significant at 10%. Other materials (e.g. miscellaneous expenses such as levies, cost of sales, etc).

Hypotheses

Tables 3 and 4 showed that the null hypothesis which specified that inefficiency sources model do not have effects in the use of resources is accepted. Moreso, δ = 1, = δ =2, =…, δ = 5≠0. This implies that the entire delta (δ) estimates are not zero. It further revealed that the delta variables estimated contributed significantly to the inefficiency of the fluted pumpkin farmers in the study area. Also, that the χ^2- calculated is less than the χ^2-tabulated (table 4) indicating the relevance of the variables in fluted pumpkin production.

Table4: The generalized likelihood ratio test for the parameter of the inefficiency sources model.

Log(likelihood)	χ^2 Statistics	$\chi^2_{V.095}$	Decision
0.150	3.08	24.62	Accept Ho

Source: Field survey, 2009.

CONCLUSION

This study focused on the analysis of economic efficiency of fluted pumpkin farming households in Ilorin, Kwara State. The findings showed that all the farmers were operating at a high technical, allocative and economic efficiency level of 90% or more, though not at exactly 100% level. The result agreed with the findings of Ayanwale and Abiola (2008) who found that an average fluted pumpkin farmer in Edo State of Nigeria utilized resources below optimum level. The research therefore concluded that it is more advisable for fluted pumpkin farmers in the study area to adopt this technology with a view to make more profit and to be more economically efficient in their investment decision.

The results further, concluded that year of experience was found to be statistically significant at 1 per cent. The results of the hypotheses which showed that the beta (β) are different from zero also revealed the production variables: plot, fertilizer, labour, seed and other materials are relevant to the technical and allocative efficiency. More so, delta (δ) values representing the farmers specific variables (years of experience, age, household size, and level of education of farmers) are also relevant in the production system.

The inefficiency sources model showed that only years of experience and size of plot (farm size) are significant factors. Thus it can therefore be concluded that farming experience and size of plot influenced level of inefficiency among the producers. On the basis of the findings, the study therefore recommends that the government should provide a conducive environment for the establishment of modern irrigation facilities for dry season farming, encourage more citizenry, especially the youths to practice dry season vegetable farming in a bid to alleviate poverty status and unemployment in the state and the country at large.

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